

What Is Claimed:

1. A knife gate valve comprising:

a valve body comprising mating halves that in an assembled configuration define a flow channel extending through the body,

a knife gate adapted to slide within a gate channel between the halves of the valve body into an open position that allows flow within the flow channel and a closed position that blocks flow within the flow channel,

a gate seal mounted in a gate seal chamber defined by the mating valve body halves, the gate seal having a sealing surface lining the gate channel for creating a seal with the knife gate, and an integral gasket extending from the gate seal in a direction opposite the sealing surface and compressed between the body halves; and

a chest seal mounted in a chest seal chamber defined by the mating valve body halves, the chest seal comprising a body member having a peripherally enclosed knife gate slot for receiving the knife gate, expandable sealing surfaces on upstream and downstream sides of the knife gate slot for creating a seal with the knife gate, and one or more injection chambers adapted to receive an injectable packing, each chamber having a cross-sectional area that is completely surrounded by the body member.

2. The valve of claim 1, wherein the gate seal and the chest seal comprise a single integral elastomeric member.

3. The valve of claim 1, further comprising one or more scrapers positioned above or below the chest seal.

4. The valve of claim 3, comprising a set of four scrapers positioned one upstream and one downstream of the knife gate slot both above and below the chest seal.

5. The valve of claim 1, wherein the chest seal comprises convex expandable sealing surfaces.

6. The valve of claim 5, wherein the convex expandable sealing surfaces comprise rounded surfaces defining a single arc from a lower plane of the chest seal to an upper plane of the chest seal.

7. The valve of claim 1, wherein the gate seal and the chest seal are separate components.

8. The valve of claim 1, wherein the gate seal and the chest seal each comprise an elastomeric material.

9. The valve of claim 8, wherein the elastomeric material comprises EPDM or a fluoroelastomer.

10. A knife gate valve comprising:

a valve body comprising mating halves that in an assembled configuration define a flow channel extending through the body,

a knife gate adapted to slide within a gate channel between the halves of the valve body into an open position that allows flow within the flow channel and a closed position that blocks flow within the flow channel, and

a gate seal mounted in a gate seal chamber defined by the mating valve body halves, the gate seal having a sealing surface lining the gate channel for creating a seal with the knife gate, and an integral gasket extending from the gate seal in a direction opposite the sealing surface and compressed between the body halves.

11. The valve of claim 10, wherein the gate seal comprises an elastomeric material.

12. The valve of claim 11, wherein the elastomeric material comprises EPDM or a fluoroelastomer.

13. A gate seal for mounting in a gate seal chamber defined by mating valve body halves of a knife gate valve, the knife gate valve comprising a flow channel and a knife gate slidable in a gate channel between an open position that allows flow within the flow channel and a closed position that blocks flow within the

flow channel, the gate seal having a sealing surface lining the gate channel for creating a seal with the knife gate in the closed position, and an integral gasket extending from the gate seal in a direction opposite the sealing surface and compressed between the body halves.

14. A knife gate valve comprising:

a valve body comprising a flow channel extending through the body,

a knife gate adapted to slide within a channel into an open position that allows flow within the flow channel and a closed position that blocks flow within the flow channel, and

a chest seal mounted in a chest seal chamber, the chest seal comprising at least one body member having an expandable sealing surface for creating a seal with the knife gate and at least one injection chamber adapted to receive an injectable packing, the chamber having a cross-sectional area that is completely surrounded by the body member.

15. The valve of claim 14, wherein the chest seal comprises an expandable sealing surface for contact with at least one of an upstream or a downstream side of the knife gate.

16. The valve of claim 15, wherein the chest seal peripherally surrounds a knife gate slot for receiving the knife gate and comprises an expandable sealing surfaces on both the upstream and the downstream side of the knife gate.

17. The valve of claim 16, wherein the chest seal comprises a single integral body member that peripherally surrounds the knife gate slot.

18. The valve of claim 14, wherein the expandable sealing surface of the chest seal is convex.

19. The valve of claim 18, wherein the convex expandable sealing surface comprises a rounded surface defining a single arc from a lower plane of the chest seal to an upper plane of the chest seal.

20. The valve of claim 14, wherein the chest seal comprises an elastomeric material.
21. The valve of claim 20, wherein the elastomeric material comprises EPDM or a fluoroelastomer.
22. The valve of claim 14 further comprising one or more scrapers positioned above or below the chest seal.
23. The valve of claim 22 comprising one scraper positioned above the chest seal and one scraper positioned below the chest seal.
24. The valve of claim 23 comprising a set of four scrapers positioned one upstream and one downstream of the knife gate slot both above and below the chest seal.
25. A chest seal for mounting in a chest seal chamber of a knife gate valve, the knife gate valve comprising a flow channel and a knife gate slidable between an open position that allows flow within the flow channel and a closed position that blocks flow within the flow channel, the chest seal comprising at least one body member having an expandable sealing surface for creating a seal with the knife gate and at least one injection chamber adapted to receive an injectable packing, the chamber having a cross-sectional area that is completely surrounded by the body member.
26. The chest seal of claim 25, wherein the chest seal peripherally surrounds a knife gate slot for receiving the knife gate and comprises expandable sealing surfaces on both an upstream side and a downstream side of the knife gate.
27. The chest seal of claim 26 comprising a single integral body member that peripherally surrounds the knife gate slot.
28. The chest seal of claim 25, wherein the expandable sealing surface of the chest seal is convex.

29. The chest seal of claim 28, wherein the convex expandable sealing surface comprises a rounded surface defining a single arc from a lower plane of the chest seal to an upper plane of the chest seal.

30. The chest seal of claim 25, wherein the chest seal comprises an elastomeric material.

31. The chest seal of claim 30, wherein the elastomeric material comprises EPDM or a fluoroelastomer.